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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/902,691      | 07/12/2001  | Li Li                | M4065.0159/P159-A   | 3130             |

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EXAMINER

BROCK II, PAUL E

| ART UNIT | PAPER NUMBER |
|----------|--------------|
| 2815     |              |

DATE MAILED: 09/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                 |              |
|------------------------------|-----------------|--------------|
| <b>Office Action Summary</b> | Application No. | Applicant(s) |
|                              | 09/902,691      | LI ET AL.    |
|                              | Examiner        | Art Unit     |
|                              | Paul E Brock II | 2815         |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. §.133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 17 June 2003.

2a) This action is FINAL.                    2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 59,60,62,64,66-84 and 92-95 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 59,60,62,64,66-84 and 92-95 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 01 November 2002 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some \* c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 13.

4) Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.

5) Notice of Informal Patent Application (PTO-152)

6) Other: \_\_\_\_\_.

## DETAILED ACTION

### *Drawings*

1. The drawings were received on November, 1, 2002. These drawings are approved.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 59 – 60, 68 – 84, 92 – 95 are rejected under 35 U.S.C. 102(b) as being anticipated by Irinoda (USPAT 5726499).

With regard to claim 59, Irinoda discloses in figure 2 and 6 – 9f an integrated circuit substrate. Irinoda discloses in figure 2 and 6 – 9f and column 16, lines 1 – 11 an oxide layer (503) formed over the substrate. Irinoda discloses in figure 2 and 6 – 9f a plurality of cylindrical contact holes (one of which is defined by 103 and 102a) formed in the oxide layer, the plurality of contact holes extending to a topmost surface (surface between 104 and 102) of the oxide layer and having reduced sidewall striations, thereby reducing critical dimension loss between the contact holes. It is noted that the remaining limitations in claim 59 following, and including, “said reduced striations resulting from the application of a first power level plasma...” are

product-by-process limitations that do not patentably distinguish the claimed invention over the prior art.

With regard to claim 60, Irinoda discloses in figure 2 and 6 – 9f and column 15, line 59 wherein the substrate is a silicon-based substrate.

With regard to claim 92, Irinoda discloses in figure 2 and 6 – 9f an integrated circuit substrate. Irinoda discloses in figure 2 and 6 – 9f and column 16, lines 1 – 11 an oxide layer (i.e. 503) formed over the substrate. Irinoda discloses in figure 2 and 6 – 9f a plurality of recesses (one of which being 503a and 503b, and another being 514d and 514c) formed in the oxide layer, sidewalls of the recesses forming sidewalls of cylindrical contact holes extending to a topmost surface (i.e. surface between 512 and 503) of the oxide layer and having reduced sidewall striations. Irinoda discloses in figure 2 and 6 – 9f wherein the substrate has a decreased critical dimension loss compared to the critical dimension loss of a substrate formed by other processes. It is noted that the remaining limitations in claim 92 referring to power level plasmas are product-by-process limitations that do not patentably distinguish the claimed invention over the prior art.

With regard to claims 68 – 84, and 93 – 95 Irinoda reads on claimed limitations. It is noted that the limitations in claims 68 – 84, and 93 are product-by-process claims that do not patentably distinguish the claimed invention over the prior art.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 62, 64 and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Irinoda as applied to claim 59 above, and further in view of Summerfelt et al. (USPAT 5612574, Summerfelt).

It is not clear if Irinoda teaches the substrate is a gallium arsenide substrate, a germanium substrate, or a DRAM substrate. Summerfelt discloses in figure 1 and column 3, lines 3 – 11 wherein the substrate is a germanium substrate. Summerfelt discloses in figure 1 and column 3, lines 3 – 11 wherein the substrate is a gallium arsenide substrate. Summerfelt discloses in figure 1 and column 2, lines 3 – 8 wherein the substrate is a DRAM substrate. It would have been obvious to use the substrates of Summerfelt in the device of Irinoda in order to use the most efficient and appropriate substrate for the intended application of the device.

6. Claim 66 is rejected under 35 U.S.C. 103(a) as being unpatentable over Irinoda as applied to claim 59 above, and further in view of Foote et al. (USPAT 5710067, Foote).

It is not clear if Irinoda discloses an antireflective coating. Foote discloses in column 1, lines 21 – 48 wherein a substrate has an antireflective coating thereon. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the

antireflective coating of Foote in the method of Irinoda in order to exhibit the requisite optical parameters to suppress multiple interference effects caused by the interference of light rays propagating in the same direction due to multiple reflections in the photoresist film as stated by Foote in column 1, lines 21 – 48.

***Response to Arguments***

7. Applicant's arguments filed June 17, 2003 have been fully considered but they are not persuasive.

8. With regard to applicant's argument "the contact hole 102a is defined by the oxide layer 102 that contacts an aluminum electrode 201. (COL. 12, line 67). Therefore, Irinoda cannot have a contact hole 'extending to a topmost surface of [an] oxide layer,'" it should be noted that the contact hole of Irinoda is defined in an oxide layer 102 by the portions 103 and 102a as shown in figure 6. When a topmost surface of the oxide layer is considered to be the interface between layers 104 and 102, the portions 103 and 102a together clearly extend to the topmost surface of the oxide layer. Therefore, applicant's arguments are not persuasive and the rejection is proper.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul E Brock II whose telephone number is (703)308-6236. The examiner can normally be reached on 8:30 AM-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703)308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Paul E Brock II  
September 15, 2003

A handwritten signature in black ink, appearing to read "Paul E Brock II".